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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,040	11/30/2001	Ronald Lee Watts	STL10564	6065
33900	7590	03/09/2005	EXAMINER	
FELLERS, SNIDER, BLANKENSHIP, BAILEY & TIPPENS, PC 100 NORTH BROADWAY SUITE 1700 OKLAHOMA CITY, OK 73102-8820			GARBER, CHARLES D	
			ART UNIT	PAPER NUMBER
			2856	

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/998,040

Applicant(s)

WATTS ET AL.

Examiner

Charles D. Garber

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10, 13-29 and 31-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31-34 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 13, 14, 22-28 is/are rejected.
- 7) ☒ Claim(s) 3, 5-8, 10, 15-21 and 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 02/04/2005 have been fully considered but they are not persuasive.

Regarding claim 1, Applicant argues Examiner misinterpreted the specification when determining Applicant disclosed any material non used in manufacturing component of the device should be assumed to be candidate materials for maker impurity. Examiner does not agree. Applicant on page 5 lines 16-21 is clearly defining candidate marker impurities as materials that are not used in the manufacture of disks.

While Applicant then further discloses that preferable materials are those with different elemental properties and further being materials such as radioactive materials or very hard materials or luminous materials that are even easier to detect, Applicant nonetheless has broadly defined candidate tracers as materials not used in manufacture in detectable amounts. Environmental dust, like that in typical disk usage environment as taught by Sharma, is not a material used in manufacturing disks.

Furthermore, ground material that is substantially absent from the disc drive (see figure 1) is then mixed with "talc or other suitable carrier 125" to reduce expense. There is no requirement that the talc or other suitable carrier be a material that is substantially absent from the disc drive. So in effect the tracer material that is introduced into the chamber is not wholly comprised of material that is substantially absent from the disc drive. Suitable carrier may broadly include anything of a suitable size, which might include the environmental dust of Sharma.

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Applicant claims each particle contains marker impurity. However, the dust is a combination of "material substantially absent from the disk" as well as talc or other suitable carrier. Examiner concludes any given particle may broadly be any suitable material and not as Applicant asserts, a material substantially absent from the disk.

As for claim 26, arguments are substantially the same as those for claim 1 regarding what may be considered to be marker impurity. Examiner maintains environmental dust may be considered a marker impurity as any suitable material may be a marker impurity.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 14, 23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharma et al. (US Patent 6,446,517) in view of Material Bulletin, "PIT

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Environmental Test Method” IBM (from Applicant’s IDS, henceforth referred to as “IBM Material Bulletin”).

Regarding claims 1, Sharma discloses testing disk drives including at least one drive 20 shown in figure 1 positioned for testing. The drive may have a filter to prevent contamination and is therefore considered otherwise sealed. Disk drives inherently have cavities. Particle chamber 12 is an impurity chamber inherently at a first pressure and containing thousands of dispersed gas-borne particles.

Sharma also discloses testing plural prototypes which is considered a multiplicity.

Sharma lacks maintaining a pressure of the cavity at a second pressure lower than the first pressure.

IBM Material Bulletin teaches products which may be susceptible to damage from dust may be tested as shown in figure 2. The product interior is connected to a blower and filter which produce a small vacuum in order to produce a positive flow from the dust laden test chamber through any openings that may exist (paragraph 8.3)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to produce a small vacuum in order to increase the chances of detecting undesired openings in the product housing.

Sharma exposes the device exterior to the impurity chamber (abstract) and evaluates the device based on performance but not expressly upon an indication of whether the particles present in the selected device at an amount exceeding a predetermined threshold.

IBM Material Bulletin also teaches establishing recommended acceptance criteria in terms of a threshold amount of dust in $\mu\text{g}/\text{m}^2$ (paragraph 11 and table 2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to ensure an acceptable failure rate is not surpassed.

Sharma does not expressly recite the “particles each contain a marker impurity that is substantially absent from all of the interior surfaces of the selected device”.

However, Applicant’s specification on page 5 explains “any material not used in manufacturing components of the device should be assumed to meet this condition”. Sharma discloses test “contaminants 26 may be compositionally identical to dust particles typically found in the working environment of a hard disk drive”, the environment being an external environment. Examiner considers that such dust particles implied by Sharma are not of material used in the construction of the disk drive.

As for claim 14, as discussed above with respect to claim 1 the references taught evaluating the units with respect to acceptance criteria. This implies failing the others if the amount of impurity exceeds the threshold. Though the threshold amount is not effectively zero Examiner considers it would have been obvious to one having ordinary skill in the art at the time the invention was made for the amount to be effectively zero, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

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As for claim 23, IBM Material Bulletin teaches acceptance criteria based on acceptable particle concentration, which is further based on a level that will degrade performance in terms of inducing failure of the product.

Regarding claim 26, Sharma discloses testing disk drives including at least one drive 20 shown in figure 1 positioned for testing. The drive may have a filter to prevent contamination and is therefore considered otherwise sealed. Disk drives inherently have cavities. Particle chamber 12 is an impurity chamber inherently at a first pressure and containing thousands of dispersed gas-borne particles.

Sharma also discloses testing plural prototypes which is considered a multiplicity.

Sharma exposes the device exterior to the impurity chamber (abstract) and evaluates the device based on performance during a test using tester 44 but not expressly using the marker impurity.

IBM Material Bulletin also teaches monitoring the accumulation of dust at points of interest within the product (paragraph 8.7). This information is used in establishing recommended acceptance criteria in terms of a threshold amount of dust in $\mu\text{g}/\text{m}^2$ (paragraph 11 and table 2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the accumulation of dust within the product so that it may be related to product failure in order to establish acceptance criteria based on dust accumulation.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sharma et al. (US Patent 6,446,517) as modified by Material Bulletin, "PIT Environmental Test

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Method” IBM (from Applicant’s IDS, henceforth referred to as “IBM Material Bulletin”) and applied to claim 1 above and further in view of Ogino (US Patent 5,109,380).

Regarding claim 2, the references lack the selecting step (a) comprises steps of:
(a1) leak-testing at least some of the multiplicity of data handling devices; and
(a2) finalizing the selection step (a) by selecting the at least one device based on an outcome of the leak-testing step (a1).

Ogino discloses test apparatus and methods for conducting Failure Mode and Effects Analysis (FMEA) of sealed electronic subsystems such as those used in satellites where high reliability is demanded.

Ogino teaches “it is necessary to ... conduct leakage tests before ... an environmental test” in which dust may clog a part.

It would have been obvious to one having ordinary skill in the art at the time the invention was made in order to screen out parts that are likely to fail from environmental testing.

Claims 4 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharma et al. (US Patent 6,446,517) as modified by Material Bulletin, “PIT Environmental Test Method” IBM (from Applicant’s IDS, henceforth referred to as “IBM Material Bulletin”) and applied to claim 1 and 26 above and further in view of O’Holleran (US Patent 4,744,919).

Regarding claims 4 and 27, the fans 30 and 32 will agitate the contaminant to disperse the it into the gas atmosphere of the chamber. However the references do not

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expressly teach providing a mixture comprising the marker impurity and a carrier impurity

O'Holleran teaches doping a natural mineral clay carrier with rare earth elements to form tracer particles (Abstract, Background of the Invention, Objects and Summary of the Invention). Such a mixture is superior gaseous tracers as well as "particulate tracers such as oil fog, smoke and die particles" which "all have drawbacks."

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine a tracer material with a carrier to form tracer particles as this is advantageous over other particles such as oil fog, smoke and die particles that have drawbacks.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sharma et al. (US Patent 6,446,517) as modified by Material Bulletin, "PIT Environmental Test Method" IBM (from Applicant's IDS, henceforth referred to as "IBM Material Bulletin") and applied to claim 1 above and further in view of Retta et al. (US Patent 5,138,871)

Regarding claim 22, the reference lack the evaluating step (d) includes a step (d1) of analyzing the chemical content of a media defect with a spectrum analyzer to verify that the defect contains some of the marker impurity.

Retta discloses a leak testing method teaching the use of fluorescent particles which are detectable during test. "The presence of fluorescent microspheres will result in a characteristic waveform... which is distinguishable from the background waveform"

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use spectral analysis, as this is effective in distinguishing detectable particles from background in a leak test.

Claims 13 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharma et al. (US Patent 6,446,517) as modified by Material Bulletin, "PIT Environmental Test Method" IBM (from Applicant's IDS, henceforth referred to as "IBM Material Bulletin") and applied to claim 1 above and further in view of MIL-STD-810E Method 510.3 "Sand and Dust" henceforth referred to as "Method 510.3".

Regarding claim 13, the reference do not expressly recite the cavity is a localized portion of a device housing interior bounded by the interior surfaces, and in which the exposing step (c) includes a step (c1) of operating the selected data handling device(s) so that the localized portion is partially evacuated. However, Method 510.3 teaches operating devices under blowing dust in order to evaluate performance degradation over time. Furthermore, Examiner considers the operation of the device 20 of Sharma will inherently create localized areas of low pressure due to the spinning disk.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to operate the disk of Sharma during a dust test as taught by Method 510.3 in order of evaluate the its performance as a function of time and thereby predict its future performance in dust laden environments.

Claim 28 is considered to be substantively the same as claim 13. Any seal may be considered to be imperfect in some respects.

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Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sharma et al. (US Patent 6,446,517) as modified by Material Bulletin, "PIT Environmental Test Method" IBM (from Applicant's IDS, henceforth referred to as "IBM Material Bulletin") and applied to claim 1 above and further in view of Pederson (US Patent 5,109,304).

Regarding claim 24, Sharma discloses testing the drive 20 with a tester 44 during dust testing (column 2 lines 47-49, column 2 line 65 to column 3 line 1) but not expressly based on monitoring an average bit error rate (BER) to determine whether a significant BER change occurs as in the instant invention.

Pederson teaches "Typical testing of a disk drive serves to detect whether the bit error rate (which may be due, in part, to bit shifting) is within preset limits. If not, the disk drive, or at least certain tracks or sectors, is determined to be defective." It would have been obvious to one having ordinary skill in the art at the time the invention was made to test to determine changes in BER outside of preset limits because this is a typical method of determining if disk drives are defective.

As for claim 25, references disclose the claimed invention except for the acceptable limit being 3% growth in BER. It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine an acceptable limit of 3% growth in BER, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Allowable Subject Matter

Claims 3, 5-8, 10, 15-21 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 31-34 are allowed.

See earlier Office Action for reasons for allowance.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles D. Garber whose telephone number is (571) 272-2194. The examiner can normally be reached on 6:30 a.m. to 3:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cdg



CHARLES GARBER
PRIMARY EXAMINER